Joshua Lederberg

Can Drinking Coffee Raise Chances of Skin Damage?

EVERY CELL of the human body contains enough giant molecules of deoxyribonucleic acid (DNA) —the substance that controls the transfer fo genetic characteristics—to make up 5 billion units, or nucleotides. Whenever a cell divies, a new copy of DNA must be assembled with the correct sequence of these units. An error in any one of them might be a mutation disastrous for the cell and, in the long run, for the whole organism.

For many years, this chemical process of replication was visualized as reliable enough to reassemble 5 billion units during each cell division without numerous errors, a concept that strains the imagination. But it has recently become apparent that living cells have mechanisms for proofreading and correcting the copy and that replication itself need not be quite so precise.

AS IT HAPPENS, this repair mechanism has been pointed up by the discovery that a herditary disease, Xeroderma pigmentosum, can be traced to its failure.

Cells of the skin are especially vulnerable to DNA damage caused by exposure to sunlight. And skin cells of Xeroderma pigmentosum patients lack means to repair this damage when it occurs. So the cells are more easily killed or, on occasion, they mutate to cancerous forms of growth.

As often happens, the discovery of a genetic deviation helps to focus attention more clearly on the normal process. These observations reopen questions about other factors that might influence DNA repair mechanisms.

IN 1950, Drs. Aaron Novick and the late Leo Szilard reported that caffeine was mildly mutagenic; that is, it increased the rate of mutational errors in bacterial cells. Ten years later, in separate studies, Drs Evelyn Witkin and Margaret Lieb showed that caffeine strongly reinforced the mutagenic action of ultraviolet light. The most plausible interpretation now is that caffeine mainly interferes with DNA repairs, rather than injuring DNA directly.

The possibility that caffeine might be mutagenic has stimulated some genetic studies on fruit flies and on mice, but the results have been inconclusive. Fot technical reasons, it is far more costly to study whole animals, or even tissue cells, than bacteria.

THERE IS NO epidemiological evidence linking coffee to cancer; I doubt it has ever been sought. Hence it would be premature to condemn coffee as a public health hazard comparable, say, to cigarettes.

The most critical rationale would be to look for an effect of coffee drinking on the rate of skin cancer among people of light complexion heavily exposed to sunburn. So we might survey Scandinavian skiers—but I suppose they all drink coffee anyhow.

It would be reasonable to go easy on drinking coffee, tea or other caffeine-rich beverages just before or after sunbathing. But until there are some relevant statistics or deeper biochemical insights, this is only a rational speculation.

We have also begun to understand other mechanisms for repairing DNA. Many cells have a "photo-reactivation" enzyme that uses blue wavelengths to repair some damage caused by ultraviolet. Sunlight is rich in both, so it stimulates some repair or its own injury.

Finally, Novick and Szilar's original work showed that some chemical analogues of caffeine are ANTI-mutagenic, and might be useful to prevent mutation. In the light of current concerns about genetic damage from chemicals, these older observations call for serious reinvestigation.

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